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Department of Water Resources

State of California

Attn.: Paul Dabbs

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Ladies and Gentlemen:

SUBJECT: California Water Plan *Update 2003*; Progress and Process Comments.

I am a named member of the Extended Review Forum (ERF) for the subject process. I have attended 3 or 4 meetings where DWR and the Advisory Committee (AC) for the same process have explained progress with the process and invited comments. I attended a most recent meeting on 9/17/03, in Alhambra, advertized as being specifically for ERF members, where yet other requests were made for comments on specific, draft, interim chapters and other materials intended eventually to be parts of the *Update*. I have found many of the materials through the DWR's Update-process website: [http://www.waterplan.water.ca.gov/\[etc\]](http://www.waterplan.water.ca.gov/[etc]).

What follows are the only comments I intend to make on this *Update*. I make them because: a) they were repeatedly solicited, b) as a named member of the ERF, I think I should say something about the topic sometime, and c) I find the updating process to be particularly fouled-up and adrift this particular time. But I am aware that DWR has known how to do this job for many years . . . without anybody's help.

I am aware that the Water Code requires that DWR "consider" such "comments" as it receives on its Update 2003 draft materials. In my somewhat lengthy remarks that follow, I shall name and highlight those portions that *I* consider true "comments" of the to-be-considered type. The rest is just context.

## HISTORY

As a personal matter, I grew up and went to college in Tennessee, where it rains about 60 inches per year. I came to California in 1967 with two additional water-engineering degrees from a Big-10 school, where it froze every winter and we had roughly 55 inches of precipitation per year. I arrived *specifically* to work for Gerald (Jerry) Orlob in a fairly new firm he had founded called Water Resources Engineers, Inc., on: a) the feasibility of modeling by computer the salt balance of, and ground water movement within, the Santa Ana River Basin (a watershed), and b) the benefits and costs attendant to water pollution control alternatives for the San Francisco Bay region. (Those matters remain unfulfillingly topical today.) In 1968, as the result of its 1957 California Water Plan and other planning dating from the 20's, the State DWR began operation of it's State Water Project.

The best description of California's water history I have read, including the Plan's and the Project's contexts therein, was in a 1998 paper by (the same) Orlob (1)<sup>1</sup>.

## THE WATER PLANNING PURPOSE

The impetus for doing water planning (in California) is Figure 1, on the next page. The California rainfall average I found on a credible website (2). I took the population numbers for California from Orlob's paper (1) and a fairly recent editorial in a local newspaper (3). (DWR has better, more official population-statistic sources of its own.) I note in passing that several current gubernatorial candidates rail about how California's population is actually declining, due to the extant governor's mismanagement of the State's affairs. Orlob also rather oddly asserted some years ago, "Today [1997-98] the state is feeling the pressure of a phenomenal growth in population . . . [which] stresses . . . its resources . . . to levels that are now motivating emigration rather than immigration" (1, p. 188). Figure 1 does not indicate any diminution of the state's rate of population growth, and I note that the *Update* process and its materials have from the 2001-outset anticipated 13-17 million more residents in the next 13-17 years (the figures dance around, but the point is obvious).

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<sup>1</sup>Numbers in parentheses like this indicate reference materials I have used and listed (in numerical order) at the end.

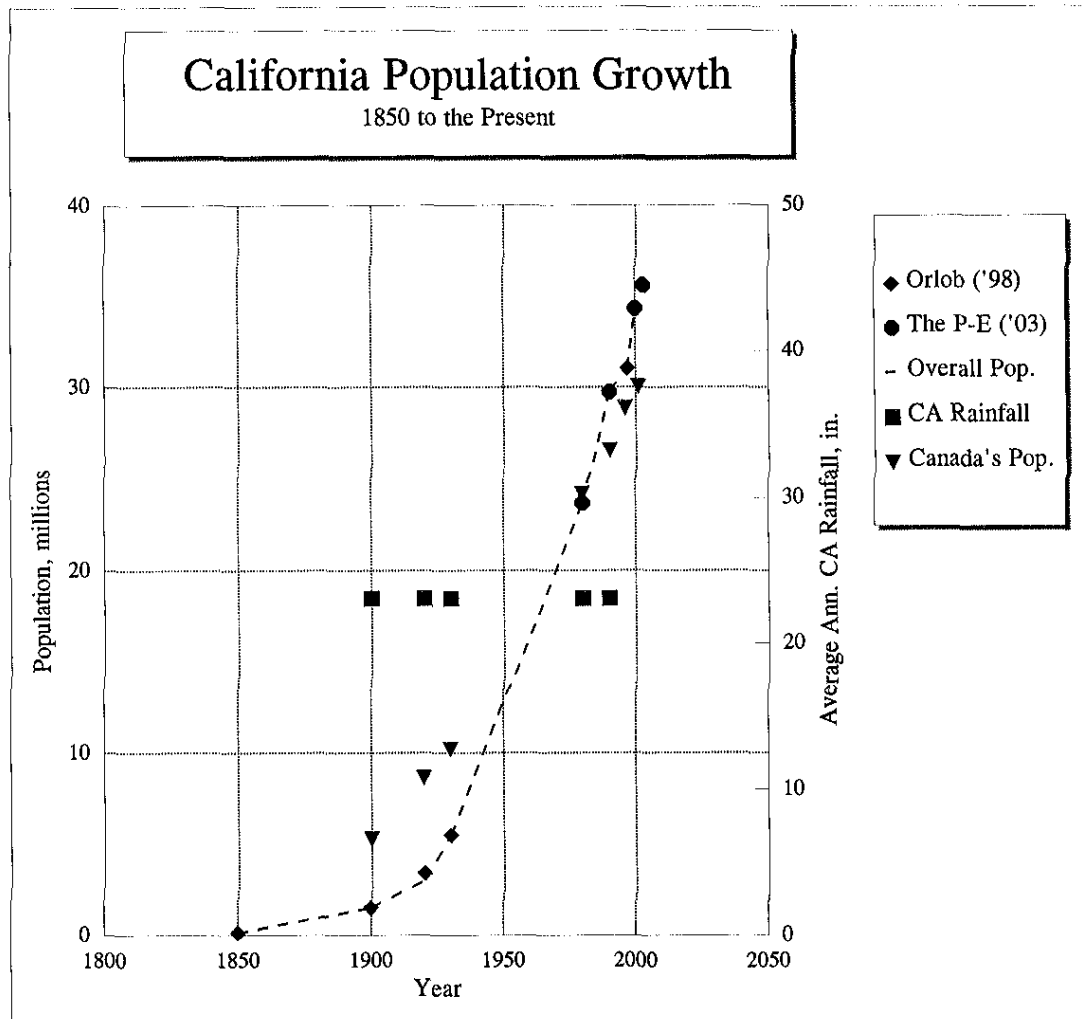


Figure 1. California Population Growth and California's Average Annual Rainfall.

I have included Canada's population because that nation, having twenty-two times the land area of California, has just about exactly the same population (4). (Actually, as the Figure shows, California passed Canada in about 1985 -- just marginally.) Canada's precipitation (converted to rainfall) measured at 16 of its major cities in 12 of its provinces, averages 33.11 in./yr. (5). Canada has 22.5 times the land area of California. It has about 2.2 times as much impounded fresh-water area (344,078 sq. mi.) as California has LAND area (155,973 sq. mi.). Canada -- though its Environment Canada performs water planning as routinely as DWR does -- won't face a water 'problem' worthy of the name for a thousand years; possibly it never will.

Yes, there are tortoises and farmers and milk vetches and Shoshonis and car mechanics and mountain counties and trout fisherman and duck hunters and lake lovers, and they're important. But what compels California, or any state, to make a Water Plan is a growing overall population of people. What compels its urgency is a *rapidly* growing population.

## THE CONFUSION OF LARGE NUMBERS

The state has a current population of 35,000,000 people, going to 50,000,000 people in a few years -- 100,000,000 eventually. Assuming they and their industries need 110 gallons per person per day, or 40,178 gallons per person per year, fifty million people, then, will need 6,165,003 million gallons per year. Agriculture, Orlob reported (1, p. 188), requires 28 million A-ft/yr. Between agriculture and people, then, this amounts to 11,133,000 million gallons. 11.133 trillion gallons. Every year. 34.165 million acre-ft/yr. Remember that.

Twenty-three inches of water fall from the sky on California's 155,973 square miles every year. *That piles up to 3,587,379 sq.-mi.-inches/yr. of water. That amounts to 191,326,880 acre-feet per year.* There are 325,851.43 gallons per acre-foot. My heavens, that's equivalent to 62,344.14 billion gallons per year. That's 62.344 trillion gallons.

Oh. That's a lot. Why, it's 5.6 times more than future-California needs! But, eighty-five percent of what falls on California runs into the ocean, percolates away, evaporates, or is otherwise lost, you estimate? That only leaves 9.352 trillion gallons. Why, that doesn't leave enough! We need to develop more supply. We need to get busy. We need a Plan! Right? Is it possible that these huge numbers become so overwhelming that politicians and just plain citizens get lost, hopelessly confused? Isn't that why the politicians decide eventually that they need a DWR to sort it all out and make a Plan, and that even DWR needs an Advisory Committee to keep DWR scientists and engineers straight? I think so.

## THE MANDATES AND MARCHING ORDERS

The DWR website lists certain codes, bills, and acts that it considers the background for why

DWR, *Update 2003*, 10/01/03, p. 5.

the *Update 2003* book will contain what it contains and why its production has followed the process it has. These are: Certain sections of the Water Code, amended to appear as they now do by certain legislative mandates, which include: The Burton Bill, the Machado Bill, and the Poochigian Bill; the Matthews Act; and the Bagley-Keene Act. I describe each of these shortly below, to indicate briefly what each does and to describe why, as I interpret them, they are relevant to the process and why -- or the degree to which -- they are even mildly interesting to me.

#### The California Water Code (10004 -10011)

I have found at a portion of the water plan's website (6) not only Sections 10004 to 10011 of Part 1.5 (The California Water Plan) of Division 6 of the Water Code, but also subsection (a) of Section 10013. (There is apparently no Section 10012, but I don't really know that.)

I find the relevant and interesting bits therein to be: 10004(b)(1) The department (DWR) shall update the plan "every five years;" 10004(b)(2) the department shall "establish an advisory committee" comprised of representatives of "agricultural and urban water suppliers, local government, business, production agriculture, and environmental interests, and other interested parties;" 10004.5 the department shall include in the plan a "discussion of various strategies" for water management to include an explicitly given list, the first item of which is "the development of new water storage facilities;" 10004.6 (c)(1) - (9) the department is directed to "release" (publish), "at a minimum, assumptions and other elements" of data such as rainfall, runoff, water uses, population, and etc. -- all of which are vital and rudimentary to knowledge about and solution of the water-planning rubric: input minus output equals change in storage; 10005(a) and (b) and Sections 10005.1 and 10005.2 whose purposes and relevancies are unintelligible to me; 10008 which acknowledges the presence among us of the Federal government's considerable water developments in California and which encourages their continuance; 10011(a), (b), and (c) which I find both inappropriately parochial toward the 'Sacramento-San Joaquin Delta' interests and dismissive of those same interests unless money to support meeting with those very people is not made available by the Legislature.

I find Section 10013(a) of the Water Code to be troubling. It says, in essence, the department "shall include" in the California Water Plan "a report on" all the *non*-State water projects and developments intended to meet (current and near-term) demands by various regional to very localized water users. The extant draft Chapter 4 now on the website is clearly the result of this Section.

#### The Burton Bill (SB 1341)

The Burton Bill text at the website (7) is interesting for three reasons: a) "Section 1" calls into question whether future water uses in the state can be met by present facilities and supplies or whether additional supplies must be developed, i.e., facilities constructed.

DWR, *Update 2003*, 10/01/03, p. 6.

b) To "reconcile" those apparent differences of opinion Sections 10004(a) and (b) are amended (as described previously), Section 10004.5 is amended to include the required "discussion of various strategies," and Section 10004.6, as described above, "is added to the Water Code."  
c) Someone, surely DWR, has devised and included at the website (8) tables of "current" and "projected" data for the *Update 2003* Plan, which are called the "Burton Bill tables" and which are to include the items discussed above from Section 10004.6(c) . . . hydrology, water uses, etc. ... dealing with inflow minus outflow equals change in storage.

So, the Burton Bill of September 2000 is a basic mandate-source for how *Update 2003* is being devised -- somewhat if not largely by committee.

#### The Machado Bill (SB 672)

The Machado Bill text from the website (9) is interesting and relevant because it added section 10013(a) to the Water Code (as described above). It is also just mildly interesting and NOT relevant because it amended Section 10620 of the code to require urban water management plans -- already mandated in existing law -- to include a description of "management tools and options" that "minimize the need to import water from other regions." The coolness of my interest in this aspect of the bill results because every responsible urban supplier I have ever experienced -- which includes every California one I know -- has never done anything else. Section 10620 is not relevant because it is not directed to DWR or the California Water Plan.

#### The Poochigian Bill (SB 1062)

The Poochigian Bill of 1999 as given at the website (10) is interesting (to me) and relevant only because it indicates that the requirements for an "advisory committee" and a discussion of "strategies," their implementation requirements, and their advantages and disadvantages have been in place longer than either the Burton Bill or the Machado Bill had indicated.

#### The Matthews Act (AB 2587)

The Matthews Act of 2002 (11) requires DWR to include within "Bulletin 160" (i.e., *Update 2003* and subsequent updates) a "forecast" of "related water use" for agricultural water needs.

This Act is the clear mandate for the subsequent report on the Future of California Agriculture, described later herein. The Matthews Act is *relevant* because the Water Code, as amended earlier by the Burton Bill (in 2000) at Section 10004.6(c) *had not included* (!) agricultural water demands among the list of required data items.

DWR, *Update 2003*, 10/01/03, p. 7.

The Matthews Bill is *interesting* because, as Orlob (1) had reported only a few years ago, "Net water use (applied water use less reuse) is now about  $43 \times 10^9 \text{ m}^3$  ( $35 \times 10^6$  acre feet)<sup>2</sup> per year statewide, about 80 percent of which is for agriculture." (Emphasis added.)

#### The Bagley-Keene Open Meeting Act

This act requires that, as of 2002 (12) , meetings of "state bodies," including "advisory committees" and the AC most relevantly, should be open to the public. The three or four I have attended have been.

***Comment:***     **Though somewhat surprising, it is comforting to me as a professional engineer that both right-wing and left-wing nonscientific politicians have managed to direct DWR to perform the Water Plan process in ways, and via means, that make logical sense to me and have a high probability of arriving at planned facilities to be owned and operated by the people of California that will assure a safe and adequate water supply indefinitely.**

#### THE ALHAMBRA MEETING (& MATERIALS)

Southern California's ERF members were invited to a meeting "to find out the latest on *Update 2003* and learn about the new three-phase approach." [DWR mailer.] The meeting was held jointly with the LA & San Gabriel Rivers Watershed Council at the LA Dept. of Public Works Bldg. in Alhambra on 9/17/03. The announcement explained how the DWR, "with the help of its committee of 70 public advisors," had arrived at a "new way to update the Plan that will make it ... useful to water planners and [will] reflect the diverse interests of environmentalists, farmers, developers, Native American tribes, water districts, cities and counties" (which I take to mean: city and county governments).

Following a 1.5-hour meeting of the Watershed Council, DWR led its Update meeting, presenting slides for which hard-copy facsimiles were made available. Eventually DWR's Kamyar Guivetchi gave way to two AC-member speakers (unknown to me) -- one named Fran, the other named Kourt or Kirk.

Materials made available included a May 2003 DWR brochure (13) announcing primarily that the Plan will not be available by December 31, 2003, as mandated. The brochure makes explicit that, "It was [AC] committee members who came up with the idea for a three-phase schedule" (13, p. 2).

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<sup>2</sup>...and I have checked this conversion; it is correct.

DWR, *Update 2003*, 10/01/03, p. 8.

Two other items, printed on the two sides of a single sheet of paper, were also handed-out, and comments were expressly solicited about both at numerous moments. One was called: "[Draft] Benefits of Resource Management Strategies." The other (side) of the handout is entitled, "[Draft] Water Plan Investment Guide."

I pause to point out: I am not a humorous man, generally -- certainly not when I am working. Humor, where one finds it, is generally born of either surprise or pathos. Jeremy Irons portrayed Claus von Bulow in "Reversal of Fortune" in 1990 -- "a story so morbid that any hint of humor would seem sacrilegious" (14). The most humorous line from the show -- which recurred to me in the midst of the Alhambra meeting -- occurred when von Bulow's attorney, Alan Dershowitz, is berating Claus at dinner about how their team *must* 'reverse' the universal antipathy with which the man is viewed across America, much less throughout the jury pool. "Everybody in America hates you!" Dershowitz summarizes. "Well, that's a start!" von Bulow rejoinders. Pathetic. But funny.

I go on. The 'Benefits' table was announced as being 'one week old,' a draft, incomplete. It is a matrix of the AC's 'Strategies' down the left edge, in rows, and perceivable 'Benefits' types across the top, in columns. The table has 24 rows and 14 columns, providing opportunities for 336 intersections. Where benefits have been perceived for a given strategy, an 'x' has been inserted at the column-row intersection. The matrix already included 153 x's, and the group assembled was asked to add more x's and send-in the suggestions.

Some listed benefit types, such as 'Change in Use' and 'Reduce Drainage and Tailwater,' do not appear to me to be benefits that could accrue from any water management strategy or built facility, though they may be consequent outcomes of some. 'Conveyance' and 'Agricultural Water Use Efficiency' do not appear to be water management strategies; they may be elements or characteristics of some alternative facilities plans. Also some of the extant x's occur at tautological intersections, such as 'Drinking Water Treatment and Distribution' (a listed strategy) and 'Improve Drinking Water Quality' (a listed benefit). Lastly, there is no intent, but also no hope, of quantifying the bigness or smallness of value of any given 'x'.

The (current) Advisory Committee -- its member-makeup has changed from time to time -- includes some who have published in refereed technical journals that engineers and other water planners attempting to employ a ('the') benefit-cost method of analyzing water management plans risk confusion of positive cost elements with negative benefit elements, as well as other addition or division incongruities which can only lead to selection and proselytizing of incorrect, inefficient, and dangerous facilities.

As one who wrote a PhD dissertation in this area, and one who could not disagree more strongly with those who disparage B-C analyses -- which every human who leaves his or her bed makes accurately on each occasion, and who has twice applied it successfully for the State Water Resources Control Board in water quality contexts, nonetheless I judge this x-ing exercise to be fruitless and counterproductive. I think it should be abandoned altogether.



DWR, *Update 2003*, 10/01/03, p. 9.

The other side of the handout, the (9-17-03) 'Water Plan Investment Guide' has far more potential, it seems to me, as a useful summarization of the entire *Update*'s output. This one-page table lists rows of Resource Management Strategies and their 'Potential Net Water Benefits by 2030' in millions of acre-feet [per year]. The strategies listed (nine in all) are divided (vertically) in groups having High, Medium, and Lower [?] confidences of ever being implemented. The total acre-feet shown to be redeemable by all the strategies put together is '7.8-10.2 maf' (million acre-feet, which, I got clarified, was intended to mean maf/yr).

Kamyar Guivetchi -- who I independently assessed to be, as I have also assessed on other occasions, the smartest person in the room -- pointed out that the numbers in this table were largely if not completely derived from review of what local and regional water districts or public works departments had reported as being under active development or on the drawing boards for near-immediate implementation. The 0.2 maf of 'desalination' of ocean water entrant in the table, assigned only a Medium confidence there, was a particular entrant so derived, Kamyar elucidated.

As one who thinks that desalted sea water in the 20 maf/yr range is the ultimate source of nonprecipitation water supply for California -- for which State (facility) planning should now be underway, I asked immediately: "So, this (table) doesn't have anything to *do* with 2030?!"

"Well, it's a start," Kamyar replied. Pathetic. Just ... not funny.

**Comment:** The 'Benefits of Resource Management Strategies' table of x's revealed at the Alhambra meeting should be abandoned. DWR should determine and report its water planning outputs not because their perceived benefits appear to exceed their estimated costs (... and what other outputs would it list?), but simply because devising outputs of water planning was mandated to be among the agency's duties.

**Comment:** The 'Water Plan Investment Guide' -- a useful summarizing artifact -- should list Net Water Benefits of all 22 - 24 resource management strategies actually studied, in maf/yr, which analyses have revealed to be predictably achievable BY THE STATE (not others) by and at the year 2030.

## DRAFTS OF UPDATE CHAPTERS

### Chapter 3. Planning for an Uncertain Future

#### *The Future of California Agriculture*

I looked forward to reading the article made available by DWR (15) concerning the future of

DWR, *Update 2003*, 10/01/03, p. 10.

California's production and water-use implications, compelled by the Matthews Act, as described near the outset.

This paper says, with various shifts anticipated in direct and indirect market forces, such as global warming, California's agricultural production should (i.e., is expected to) still *increase* significantly. It should increase sufficiently to sustain California's future population, increase its domestic U. S. sales, and contribute to feeding the rest of the world.

In other words, there is not now, nor was there ever, a need to assume that California's population growth, in urban and suburban places, and its growth of nonagricultural commerce could only be enabled, absorbed, or sustained via concomitant *reductions* in either agricultural acreage or products. Both -- like environmental health sustenance and economic health growth -- are possible and expectable. The catastrophists are just wrong!

The most interesting aspect of this article -- which I don't know *how* DWR is going to use, because it contains not a single figure about water needs for agriculture -- is how, even in its title, sarcasm drips around: Why, even for money and under a legislative mandate, did we have to stop what we were doing to write this stupid thing? Yikes.

#### Chapter 4. Regional Integrated Resource Planning

##### *Regional Integrated Resource Planning* [The 'introduction' (16)]

Two things: 1) I would understand, and I think lots of people would understand, since the terminal delivery of water through the last built facility of the State Water Project was dedicated at the Wilson Ck. Spreading Grounds in Yucaipa earlier this year, that there simply will not be any additional California Water Plans. Poochigian, Machado, and Burton, among others, simply didn't understand. The announcement could be made in a single press conference. Alternately, a single sheet of paper with the typed message -- in lieu of five volumes updated every five years -- could be stuck to a nearby barn or telephone pole with a wee dirk:

THERE WILL BE NO FURTHER  
WATER PLANS FROM  
THE STATE OF CALIFORNIA.

THAT IS ALL.

DWR.

That appears to be the essential message of Chapter 4. ***IF*** that is the message, why do we need three chapters ahead of it, more chapters behind it, and four more volumes?

A man whose name I never knew, but who was a public works official for the City of Portland, Oregon, once told a friend of mine, "Muddling through is a viable alternative." It is. He was right. And if DWR chooses to believe that the Machado Bill forbids the movement ever again of any water across any watershed ridge line, then it can just sit idly and watch locals and regionals do the work, or go out of business. But the Machado Bill doesn't say that. It says, very responsibly:

(c) The health, safety, and well-being of the people of California will best be served by meeting the municipal, agricultural, and environmental water needs of each hydrologic region to the maximum extent practicable without diminishing the resources of other regions that are necessary to meet the present and future municipal, agricultural, and environmental needs of those regions, and while recognizing the continuing need in the foreseeable future to move surplus supplies between regions in order to meet the municipal, agricultural, and environmental needs of the people of California (9, p. 1. Emphasis added.)

One notes in this introduction to Chapter 4, "The state will continue to help regional planning and implementation through technical assistance, regulation, loans and grants" (16, p. 4-2). This, then, appears to be the State role for the future. One notes as well the sidebars about SB 610 which deals with water for 'developments' and SB 221 that deals with 'subdivisions' and their 'water purveyors' (16, p. 4-3). These have nothing to do with the California Water Plan. This subchapter (through p. 4-10) is replete with naive wish lists and poor grammar. An example of the latter is, "Some *considerations* for preparing integrated resource plans *is* listed in the adjacent box" (16, p. 4-4. Emphasis added.) An example of both is, "Because conditions in some regions make it much easier to consider multiple resources as opposed to other regions of the state, policymakers and resource managers should be careful about duplicating strategy mixes that are successful in one region in another" (16, p. 4-2). I'm not precisely sure what that says, but it sounds like two wrong things: a) physical conditions found anyplace make 'consideration' easier, and b) something that is 'successful' in one place should not be attempted in another.

In very large measure, Chapter 4 appears to me to be a way for regional water purveyors to chide the state government into funding, partially or otherwise, the local and regional water planning compelled in recent years by a spate of Bills and Acts. That 'way' has been facilitated most directly by these purveyors' representatives on the AC. Anyone who can read [the 1999 Poochigian bill that first called for an "advisory committee" ... "to assist the department" in updating The Plan, comprised of "agricultural and urban water suppliers, local government, business, production agriculture, and environmental interests, and other interested parties..." (10, p. 1)] will now recognize that the AC is directing, not assisting, the process and is roughly 8.3 times too large.

2) Watersheds, as the term is used in Chapter 4's introduction, appears to mean, in the avocational argot of the hydroecologically motivated, elitist retreats -- hilly if not mountainous, suburban possibly but preferably undeveloped, perpetually at least partially green places where middle-aged, mostly white, mostly Protestant women enjoy planting azaleas and picking-up cans and old tires. That's nice. Actually, no places on any continent or between any two are *not* watersheds or within one. Some are forested and mountainous; some are fairly flat and highly urbanized; others are arid, brown, and deserted. In addition, the broadest watersheds of the earth prove existentially that they are watersheds by being filled with water they cannot shed, up to their ridge lines, along which, such places as Pearl City, the Panama Canal, and Purisima Point remain always near the water's edge. Because they are ubiquitous, like bacteria and silicon atoms, watersheds are not interesting. Because California is politically and cadastrally defined -- not hydrologically, they aren't very relevant, either.

**Comment:** The State's job with respect to watersheds (as common sense and the Machado Bill in particular make clear) is to require that all surplus runoff from all of them within California be conserved (i.e., saved, stored for local use, or redistributed fairly and cost-effectively to others) -- whether the State as an organization chooses to participate in the implementation of that conservation or not.

### *North Coast Hydrologic Region*

I recently applied the "shoelace algorithm" (17), which I commend to anyone seeking the "area of a polygon whose vertices are described by ordered pairs in [a] plane" (17, p. 1), to the area of California north of the 39th parallel -- what I choose to call 'northern California.' This is a line running from Greenwood State Beach on the ocean (just south of the Navarro R. mouth), eastward through the center of Clear Lake (in Lake Co.), and on to Meeks Bay on the shore of Lake Tahoe. My 'northern California' receives most of the water that precipitates as rain on California, and it is where some serious Federal storage at Shasta ( $5.6 \times 10^9 \text{ m}^3$ ) (1, p. 189) and State storage at Oroville ( $4.37 \times 10^9 \text{ m}^3$ ) (1, p. 190) occur. That's why it's relevant in Water Plan context. It is interesting, to me, because its area (41,647.5 sq. mi) is closer to the area of Tennessee (41,220 sq. mi.), where I grew up, than to the area of any other state.

But we really don't need all of that area to teach us a great deal about CA Water Plan relevance and purpose and cultural attention to detail. Let us look simply at the watersheds DWR and the AC have agglutinated into something called the 'North Coast Hydrologic Region' (18), less than half of my 'northern California.' This area extends from the Russian River watershed in the south (and to the west) up to the Smith R. (near the coast) and the Klamath (to the east and far north). Other watersheds of interest include the basins of the Gualala, Garcia, Navarro, Noyo, Eel, Mattole, van Duzen, Mad, and Trinity Rivers. There are many more in the 'region.'

It was my pleasure (I now concede, although I complained bitterly at the time) to be the Project Manager under Dr. Orlob's direction in 1971-73 for the production of the state's first 303(e) Water Quality Control Plan for the coastal portion of this basin, called then Basin 1B. Most of the work involved my tactful endurance of local and regional squabbles with me (a private contractor, perceived by locals and regionals in public meetings to be: The State) about how more waste treatment at Eureka and Santa Rosa would break the local economy, and why can't the State just leave us alone?! One wag in Eureka wanted me to know that secondary treatment there made no sense because, "There's a whole ocean going by out there!" I knew this area pretty well at one time, and it *was* a learning experience. But things like, "Arcata's Wastewater Treatment Facility ... uses a marsh system to provide secondary treatment ..." (18, p. 4-12) are among the provincial interpretations of sanitary engineering rudiments that keep me from going back.

Here's the thing. "... water supplies [for communities] are limited throughout much of the area. Small surface water projects generally have limited carryover capacity that cannot supply adequate water during extended months of low rainfall" (18, p. 4-12). At the same time, there is the 'Burton Bill table' on p. 4-15 (where one notes, the subtitle is: "Water Entering the Region - Water Leaving the Region = Storage Changes in Region"), which shows 31.3 maf fall here in a dry year, at least 50 maf precipitate in the average year, and nearly 80 maf fall in wet years. So what happens that the poor local communities have inadequate supplies -- much less the rest of the state? "Most of the water used in the region is required [?] outflow to the ocean" (18, p. 4-11. Emphasis added). The table at p. 4-15 shows that 19 maf have to be discharged to the ocean in the average year. Nearly 35 maf have to be discharged to the ocean in every wet year (18, p. 4-15). One recalls from Basin 1B days that California Fish & Game scientists allowed as how some juvenile fish of the anadromous varieties 'required' some flushing, carriage water -- as in flood waters -- during certain periods to carry them -- impel them -- to the sea (apart, apparently, from their inherent instincts to go there). I contend that a juvenile blue whale would not require 19 maf/yr to be jostled along.

Does anyone remember that 50,000,000 people AND agriculture, which uses four times as much as the people, will one day require 34.165 maf/yr? (That was on my page 4.)

**Comment:** As in every state, watersheds sometimes have too much water, and sometimes they have too little. Water planning is an exercise in thinking ahead about conserving excess (wet-yr surplus) water as it occurs, and redistributing the stored water to places of shortage where they occur. The write-up about this single region notes and declares that California citizens, their urban commerce, and their agriculture face no serious water shortage at any time in the foreseeable future. Whoever 'requires' that more water be wasted in this watershed routinely than will be needed in this entire state pretty much ever should, at the very least, be mentioned, here, by name.

DWR, *Update 2003*, 10/01/03, p. 14.

*South Coast Hydrologic Region*

Very adequately described. (Although 'State of the region . . . '[?] hangs by itself on p. 4-26, and the top of the same page says this is in Chapter 5, which I don't think is right. Also, the third sentence on the page speaks of MWD's currently estimated "consecration savings," which clearly should be "conservation savings.")

I am glad that, while I live here on this region's eastern periphery, I don't have to drink Colorado River water, like at least some of the people here do (19).

I'm not sure how one squares, "The quantity and quality of the region's water supply are generally good" (19, p. 4-26, para. 3) with, "There are various concerns about the quality of the region's water supplies" (19, p. 4-26, para. 5). The Bunker Hill Basin, where I live, continues to have (ground water supply) quality that is manageable via fairly conventional treatment. As Orange County Water District, other engineering companies, and WRE (i.e., I) began to show in 1967 when I got here, Colorado River water is salty to the point of causing domestic and industrial disbenefits or what are called: 'consumer-related penalty costs'. Everybody knows that. Few people say it out loud or much care. 'Water is water; parts is parts' works for most water managers south of Tejon Summit; always has.

Nearly 50 years ago Karl Imhoff and Gordon Fair wrote a textbook called, unfortunately, Sewage Treatment (20). In it, they pondered at the outset why any community would provide sewage treatment; since its citizens had to bear 100% of the plant's construction and operating costs, but 100% of the benefits accrued to downstream others. Why would any city do that? "Because," they quickly deduced, "that is part of the give and take between civilized communities" (20). That was remarkable when I quoted it in 1967 in my dissertation about the benefits and costs of waste treatment alternatives. It still is.

I nonetheless continue to ponder if being forced to use Colorado R. water domestically isn't a form of 'social injustice.'

I move on. I note a bill on hand at my home today from the City of Redlands: \$60.30 for water used between 7/14 and 9/8/03. Seems reasonable. Then, \$31.60 for a "1-in. water service." Do you suppose my family and I have just about bought that 1-inch pipe, having paid \$15/mo. for it for 240 months? Then there is this second bill, from the County Tax Assessor; first installment due now; second installment due 2-01-04: \$360.50 for "San Bernardino Valley Municipal Water District Debt Service." I suppose that has been \$360.50 in each of 20 years, but I don't know that. SBVMWD is the local contractor for State Water Project (SWP) water deliveries in this subregion of the South Coast Hydrologic Region. They deliver SWP water to districts or cities who buy it. I don't think a drop has ever come to my house. Is that a 'social injustice' or just my share of civilized 'give and take?' I continue to mull that. I don't get Colorado R. water; that's worth a good bit.

***Comment:*** The majority of Chapter 4 is an interminable litany of whimpers about what is wrong with the water supplies in each of the state's many hydrologic regions. Most are described as hopelessly insoluble or as conditions local people have come to endure; occasionally they are described as conditions local or regional purveyors struggle with but never quite solve. Virtually nothing describes (and I realize this chapter was clearly not intended to include such a description) what the State of California actually intends to do. How about the State taking-on the job of treating all Colorado R. water to be supplied for M&I purposes in CA to 250 mg/L TDS or lower? In a state that spawned TRW, Intel, Dreamworks, Edwards Air Force Base, Hewlett-Packard, the Jet Propulsion Laboratory, Lawrence-Livermore Laboratory, and the Stanford Linear Accelerator, isn't it about time for some 'Buck Rogers of the 21st Century' from state government?

## Chapter 5. Resource Management Strategies

### *Introduction*

Speaking of textbooks, this effort is not about producing a textbook. So, when the Chapter begins, "A key objective of the California Water Plan is to present a diverse set of resource management strategies to meet the water needs of each region and the state as a whole" (21, p. 5-1), that shouldn't mean that the strategies listed and then described in detail should be a comprehensive list. It should be inclusive of those strategies DWR intends to employ, preferably before the next volume of the same name is launched in 2008.

It is worth stating explicitly again: The Alhambra Meeting announcement was wrong; this isn't about making a document (or 5) "useful to water planners...;" it is a water plan. THE Water Plan.

### *Agricultural Water Use Efficiency*

This is rather well done -- scholarly, even. There is entirely too much discussion (22, pp. 1; 3-4; and 6) for my taste about CALFED, the CBDA, and the CBDA 'ROD.' Those are hardly the sole or anywhere near the best original sources about agricultural water use and irrigators' efficiencies in California. Regardless of the degree to which CALFED or any of its offshoots may have attempted to speak on behalf of all the people of California -- or even have been empowered to do so, there remain many of those very people who would choose to speak -- on any subject -- for themselves.

Still, this is one of the best subchapters.

DWR, *Update 2003*, 10/01/03, p. 16.

### *Desalination*

One looks forward, somewhat, to the July 2004 Desalination Task Force report to the legislature (23, p. 5-1). Hopefully, it will be more... well, hopeful.

This rather puny subchapter on the only actual source for nonprecipitation supplies not imported from another country or state contains its own litany of: Problems, problems, problems (p. 5-3 to end). The alleged "fairly significant impacts on the coastal zone" (23, p. 5-4) from seawater intakes are unknown to me. 'There's a whole ocean ...out there!.' How hard could it be to put forty pipes (from San Diego to Crescent City), far and deep off-shore, attach a screen to 40 morning-glory spillways, turn them upside down and attach them to the ends of the forty pipes, and then -- via 40 low-head, high-flow pumps, start drawing 0.5 maf/yr (162,925.7 MG/yr or 446.1 mgd) through each one, into 40 desalters? Wouldn't hurt a daphnia. Recall, California is 'required' to put 19 million acre-feet of freshwater INTO the ocean annually (16,950.5 mgd) -- nearly 35 maf/yr sometimes. What harm does *that* do?

I am puzzled by the "50 mgd ... (approximately 50,000 acre-feet per year)" conversion at page 5-5. (One hopes DWR has a roomful of fact-checkers working on all these chapters and volumes, which are replete with numbers and their myriad conversions.)

$$50 \text{ mgd} = 50 \times 1,000,000 \text{ gal/mg} \div 325,851.43 \text{ gal/A-ft} \times 365.25 \text{ d/yr} = 56,045 \text{ A-ft/yr.}$$

Well, close. 1 mgd = 1,120.91 A-ft/yr. DWR knows that better than I do.

### *Matching Water Quality to Use*

This subchapter is not DWR's traditional area of interest. It's well-written. One notes that Met has already done DWR's benefit analysis for the TDS-reduction plant(s) I assigned herein for Colorado R. water: \$95,000,000 per year per 100 mg/L salt reduction (24, p. 5-65) = ~ \$500,000,000 annual benefit -- from the salt reduction indicated (just to Met customers). One could build and operate some serious plants for half that kind of money. It's nice to have a B/C ratio of 2.

### *Surface Storage -- Regional/Local*

This subchapter begins, again, with CALFED, and then persists (25, pp. 1; 2-4; 6). CALFED storage has its own chapter.

'...State finding.' on p. 6 should be "...State funding."



### *Urban Water Use Efficiency*

Again with CALFED (26). Urban water conservation came about in the modern sense (i.e., low-flow shower heads and low-flow and ultra-low-flow toilets) thanks to the efforts of an urban water district general manager named John Olaf Nelson. He was from Marin County. When I got to California in 1967 water engineers and the popular press generally were both convinced that one acre-foot (325,851.43 gallons, based on 231 cu. in. per gallon, which is definitional) was the amount that an 'average' family of four used in one year. Dividing 325,851.43 by 4 and by 365.25 days per year yields 223 gallons per person ('per capita') per day -- or 223 gpcd. That was just about exactly right for the Santa Ana watershed and much of the San Francisco Bay area, where I began. There were at that time, however, enclaves of *nouveau riche* in Marin County that were using as much as 600 gpcd, and Nelson was expected to supply those people. He finished his career -- over about 30 more years -- saying, 'No, sir; I won't!' Of course, that put funny toilets in the homes of all the rest of us, as well.

Today, as a result of Nelson and a whole lot of other people, the popular press routinely defines one acre-foot as the amount necessary to supply two families of 4 for a year (i.e., 111.5 gpcd). We've come a long way, baby; and I think we have done about what urban water conservation efforts can reasonably be expected to achieve, without messing fundamentally with indoor plumbing at all and the American way of life.

The greatest practitioner of water conservation in the State's history was a man named Francis Cuttle (of Riverside). He single-handedly began -- among other organizations -- one that became the San Bernardino County Water Conservation District. He hated freshwater drops, much less an A-ft, reaching the ocean. Almost no-one alive today ever heard of him.

### *Water Transfers*

It is not really very interesting that the "5 major sources" of water made available for transfer (27, p. 1) are not inclusive of water to be moved from one place to another place, i.e., across a watershed boundary. Water transfer into and out of storage is really not worth a chapter -- even a subchapter. We do that in Redlands and San Bernardino every hour, every minute in fact. Ho hum.

There is a lot of emphasis here about the Central Valley and the Bay-Delta (26, pp. 2-4).

The table at p. 7 (27) needs to be checked against the very latest Quantification Settlement Agreement, which seems to change from day to day.

I observe in closing that some among the cited sources (27, p. 13) have stated, within their papers, that the only way to sustain future M&I water supplies or their expected growth is at the (zero-sum-game-) expense of agriculture. I and others (15) don't believe that.

**Comment:** Chapter 5 should include a brief summary of those water management strategies (called-for in Poochigian and elsewhere) that DWR itself intends to implement; and it should include a summary table -- perhaps near the beginning -- of all the intended DWR strategies, showing the maf/yr that each is expected to produce in new or sustained water supply at the year 2030.

## MY CONCLUSION(S)

In May 2003, Kamyar Guivetchi was quoted (13) as having said, "This isn't your father's Water Plan!" Well, that is certainly true. Before he was 35, my father had (though not single-handedly, of course) built lock-and-dam combinations Numbers 6, 7, and 8 on the Mississippi and Possum Kingdom Dam on the Brazos. Then, Hitler invaded Poland; and he joined the Army (Corps of Engineers). Later he built many parts of the Atoms for Peace program at places like Oak Ridge, Tennessee; Paducah, Kentucky; Portsmouth, Ohio; Savannah, Georgia; Richland, Washington; and, yes, the Linear Accelerator at Stanford.

W. H. Auden -- though I haven't been able to confirm where -- is alleged to have oversimplified the human experience, *vis a vis* the mosquitos and kangaroo rats, as: "Human beings build things." I conclude that The California Water Plan needs a leader that is willing to say, "Pick up that shovel, little ditch rider, and follow me." There is work to be done ... not just endless lists of problems to compile. Douglas MacArthur didn't bother to return to West Point near the end of his life to speak about "...the Corps, and the Corps, and the Corps!" because he longed to recall the memories of putrid gym laundry and boots filled with broken-blister blood. He went to recall -- and to encourage others not to forget -- youthful infusion with: The fundamentals, and the fundamentals, and the fundamentals.

I write, at all, to bring up Figure 1, and Figure 1, and Figure 1; and to say, "Let's get busy."

Respectfully submitted,

A handwritten signature in black ink, appearing to read "M. B. Sonnen". The signature is fluid and cursive, with the first name "Michael" and last name "Sonnen" clearly distinguishable.

Michael B. Sonnen, PhD, P.E.

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